

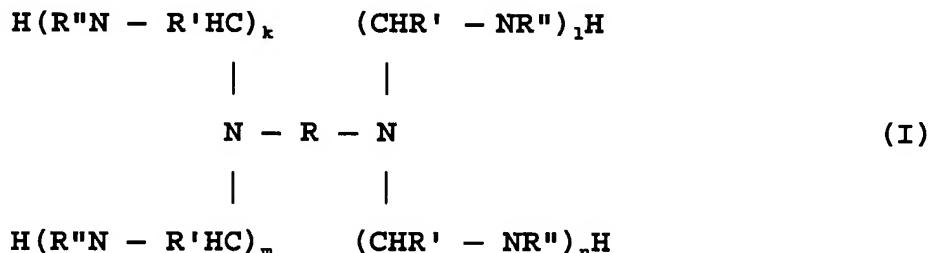
## AMENDMENTS

### In the Specification

[0002] More particularly, the present invention relates a novel sulfur scavenger including a diamine terminated reaction product of a primary amine and an aldehyde, where at least one aldehyde is added to a solution of at least one alkylamine under conditions to reduce or preclude triazine formation to produce a sulfur scavenging composition that does not liberate aldehyde upon heating and where trace imines are chemically reduced by added adding a reducing agent to the crude product prior to workup.

[0005] The present invention provides a sulfur scavenging composition including a diamine centered, oligomer or polymer of a bimolecular adduct of primary amines and aldehydes, where the composition preferably includes sufficient diamine so that the composition liberates little or no aldehyde upon heating and where the composition have has a pH between about 9 and about 13, and preferably, between about 10 and about 12.5.

[0007] The present invention also provides a sulfur scavenging composition including a compound of formula (I):

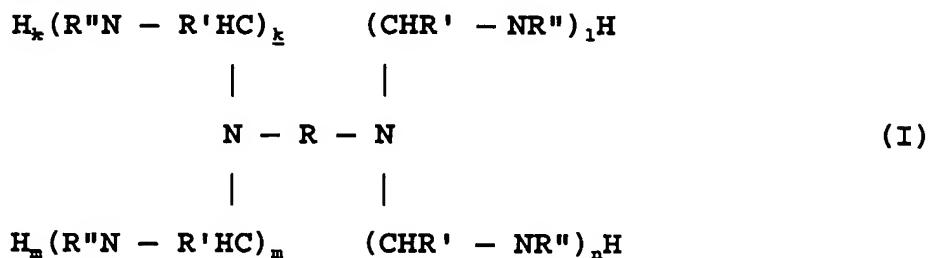


where R is an alkenyl group having between about 1 and about 20 carbon atoms, where one or more of the carbon atoms can be oxygen atoms in the form of ether, hydroxy and/or carboxy moieties and/or nitrogen atoms in the form of tertiary amine and/or amide moieties, R' and R'' are the same or different carbon-containing groups having between about 1 and about 20 carbon atoms, where one or more of the carbon atoms can be oxygen atoms in the form of ether, hydroxy, and/or carboxy moieties and/or nitrogen atoms in the form of tertiary amine and/or amide moieties, where k, l, m and n are integers having a value between 0 and 2, provided that at least one have a value of 1 or 2, where the composition preferably liberates little or no aldehyde upon heating and includes no or only trace amounts of triazines.

[0008] The present invention provides a method for preparing sulfur scavenging compositions including the steps of adding at least one aldehyde to a solution including at least one primary amine under conditions to reduce or eliminate triazine formation and adding to the reaction at least one

diamine. Preferably, the diamine is added in an amount sufficient to reduce or substantially eliminate liberation of aldehyde upon heating. The method can optionally include the step of hydrogenating any imine products to their corresponding saturated analogs through the addition of a reducing agent such as sodium borohydride.

[0010] The present invention provides a method for converting noxious sulfur species to high molecular weight sulfur species including the steps of contacting a fluid or fluid stream including noxious sulfur species with an effective amount of a sulfur scavenging or converting composition including a compound of formula (I):



where R is an alkenyl group having between about 1 and about 20 carbon atoms, where one or more of the carbon atoms can be oxygen atoms in the form of ether, hydroxy and/or carboxy moieties and/or nitrogen atoms in the form of tertiary amine and/or amide moieties, R' and R'' are the same or different carbon-containing groups having between about 1 and about 20 carbon atoms, where one or more of the carbon atoms can be oxygen atoms in the form of ether, hydroxy and/or carboxy moieties and/or nitrogen atoms in the form of tertiary amine and/or amide moieties, where k, l, m and n are integers having a value between 0 and 2, provided that at least one have a value of 1 or 2, where the composition preferably liberates substantially no aldehyde upon heating and includes no or only trace amounts of triazines, where the amount is sufficient to reduce, to reduce below a target level or to substantially eliminate the noxious sulfur species. By fluid the inventors means any combination of material including liquids, gases and/or solids that will flow at a particular operating temperature.

[0021] The present invention broadly relates to sulfur scavenging compositions including a compound of formula (I):

$[H_k(R''N - R'HC)_k][H_l(R''N - R'HC)_l]N - R - N[(CHR' - NR'')_mH][(CHR' - NR'')_nH]$  (I)  
 where R is an alkenyl group having between about 1 and about 20 carbon atoms, where one or more of the carbon atoms can be oxygen atoms in the form of ether, hydroxy, and/or carboxy moieties and/or nitrogen atoms in the form of tertiary amine and/or amide moieties, R' and R'' are the same or different carbon-containing groups having between about 1 and about 20 carbon atoms, where

one or more of the carbon atoms can be oxygen atoms in the form of ether moieties and/or nitrogen atoms in the form of tertiary amine moieties or amide moieties, where k, l, m and n are integers having a value between 0 and 2, provided that at least one have a have of 1 or 2, where the composition does not liberate aldehyde upon heating and includes no or only trace amounts of triazines.